

IN THE CLAIMS

Please cancel claims 12 through 23, 26, 27, 31, 33 through 35, 37 through 42, 45 through 48, 52 through 59, and 70 through 137. Accordingly, claims 1 through 11, 24, 25, 28 through 30, 32, 36, 43, 44, 49 through 51 and 60 through 69 are pending upon entry of this Preliminary Amendment. The purpose of this amendment is to economize on USPTO fees.

Listing of claims:

1. (original) A device for monitoring the migration or invasion of a biological particle such as a cell, which device comprises:

- a) an upper chamber adapted to receive and retain a cell sample;
- b) a lower chamber comprising at least two electrodes; and,
- c) a biocompatible porous membrane having a porosity sufficient to allow cells to migrate therethrough, wherein said membrane is disposed in the device so as to separate the upper and lower chambers from one another;

wherein migration of cells through the porous membrane permits contact between the migrating cells and one or more electrodes of said lower chamber, and wherein further said contact provides a detectable change in impedance between or among the electrodes.

2. (original) The device according to Claim 1, wherein the electrodes are disposed on the bottom surface of the lower chamber.

3. (original) The device according to Claim 2, wherein the lower chamber has a bottom surface area sufficient for attachment of a grouping of cells selected from the groupings consisting of 1-10, 10-100, 100-300, 300-700, 100-1000, 700-1,000, 1,000-3,000, 3,000-6,000, 6,000-10,000 and 1000-10000 cells.

4. (original) The device according to Claim 2, wherein the electrodes cover at least 5% of the bottom surface area of the lower chamber.
5. (original) The device according to Claim 2, wherein the bottom surface area of the lower chamber is less than 1 mm².
6. (original) The device according to Claim 1, further comprising an impedance analyzer in electrical communication with the at least two electrodes.
7. (original) The device according to Claim 1, wherein said biocompatible porous membrane comprises glass, sapphire, silicon, silicon dioxide on silicon, or one or more polymers.
8. (original) The device according to Claim 7, wherein the biocompatible porous membrane has a thickness between 2 microns and 500 microns.
9. (original) The device according to Claim 1, wherein the biocompatible porous membrane further comprises a coating for promoting the attachment of one or more cells thereto.
10. (original) The device according to Claim 1, further comprising
 - a) electrically conductive traces extending from, and in electrical communication with, the at least two electrodes; and,
 - b) connection means for establishing electrical communication between the electrically conductive traces and an impedance analyzer.

11. (original) A method for monitoring the migration or invasion of a cell, the method comprising:

- a) providing a device according to Claim 1;
- b) introducing the cells into the upper chamber of the device; and,
- c) determining whether a change in impedance between or among the electrodes occurs, which a change in impedance between or among the electrodes is indicative of the invasion of, or migration of cells into or through, the biocompatible porous membrane.

12 – 23 (canceled)

24. (original) A device for measuring electrical impedance, resistance, or capacitance of a cell/substrate interface, comprising two or more electrodes fabricated on one side of a biocompatible membrane that comprises at least one pore, wherein said device has a surface suitable for cell attachment or growth.

25. (original) The device according to Claim 24, wherein said biocompatible membrane comprises glass, sapphire, silicon, silicon dioxide on silicon, one or more plastics, or one or more polymers.

26. (canceled)

27. (canceled)

28. (original) The device according to Claim 25, wherein said biocompatible membrane comprises a coating that allows the attachment of one or more cells.

29. (original) The device according to Claim 28, wherein said coating comprises an extracellular matrix component.

30. (original) The device according to Claim 24, wherein said at least one pore has a diameter that does not permit the passage of cells used in the measuring electrical impedance, resistance, or capacitance of a cell/substrate interface through the pore.

31. (canceled)

32. (original) The device according to Claim 24, wherein said at least one pore has a diameter that permits the passage of a migrating or invasive cell used in the measuring electrical impedance, resistance, or capacitance of a cell/substrate interface through the pore.

33 – 35 (canceled)

36. (original) The device according to Claim 24, wherein at least two of said two or more electrodes have substantially the same surface area.

37 - 42 (canceled)

43. (original) The device according to Claim 36 situated in a fluid container.

44. (original) The device according to Claim 43, further comprising an impedance analyzer connected to the at least two electrodes.

45 – 48 (canceled)

49. (original) The device according to Claim 24, wherein said two or more electrodes comprise at least four electrodes.

50. (original) The device according to Claim 49, wherein the at least four electrodes are arranged in an electrode structure array of two or more interdigitated electrode structure units (IDES) or concentric electrode structure units (CCES), each of which comprises at least two electrodes.

51. (original) A device comprising the device of Claim 50, wherein said biocompatible membrane is reversibly or irreversibly attached to a structure that provides a plurality of isolated fluid containers such that at least one of the fluid containers comprises a single IDES or CCES structure unit.

52 – 59 (canceled)

60. (original) The device according to Claim 58, wherein the device is used to assay the migration or invasiveness of one or more cells through said layer of epithelial cell or endothelial cells and the lower chamber comprises at least one compound known to modulate the migration or invasiveness of said one or more cells or at least one compound suspected of modulating the migration or invasiveness of said one or more cells.

61. (original) The device according to Claim 58, wherein the device is used to assay the migration or invasiveness of one or more cells through said layer of epithelial cell or endothelial cells and the upper chamber comprises at least one compound known to modulate the migration or invasiveness of said one or more cells or at least one compound suspected of modulating the migration or invasiveness of said one or more cells.

62. (original) The device according to Claim 54, wherein said at least two electrodes are fabricated on the lower side of said membrane.

63. (original) The device according to Claim 62, wherein said at least one pore has a diameter of between about 1 micron and about 25 microns.

64. (original) The device according to Claim 62, wherein said membrane comprises at least one substance that promotes cell adhesion on the lower side of said membrane.

65. (original) The device according to Claim 62, wherein said membrane comprises at least one biomolecular coating or extracellular matrix component on the upper side of said membrane.

66. (original) The device according to Claim 62, wherein said membrane comprises a layer of epithelial or endothelial cells on the upper side of said membrane.

67. (original) The device according to Claim 62, wherein said device is used to assay the migration or invasiveness of one or more cells.

68. (original) The device according to Claim 67, wherein said lower chamber comprises at least one compound known to modulate the migration or invasiveness of cells, or at least one compound suspected of modulating the migration or invasiveness of cells.

69. (original) The device according to Claim 67, wherein said upper chamber comprises at least one compound known to modulate the migration or invasiveness of cells, or at least one compound suspected of modulating the migration or invasiveness of cells.

70 – 137 (canceled)